

REMARKS

Claims 1, 2 and 4-9 remain pending in this application. In the Office Action dated March 4, 2009, all claims were rejected for indefiniteness under 35 U.S.C. § 112, first paragraph. In addition, claims 1, 2 and 4 were rejected under 35 U.S.C. § 102(b) as being anticipated by 5,348,990 to Walpita et al. ("Walpita") with evidentiary support from the Ticona NPL document ("Ticona"), and claims 5-9 were rejected under 35 U.S.C. § 103(a) as being obvious over Walpita and Ticona in combination with 5,767,223 to Yamada et al. ("Yamada").

In view of the following remarks, it is believed that all rejections are overcome, and that the present claims are all allowable.

Written Description Rejections

Applicants reassert that the fracture rate limitation is fully supported for the reasons provided in the Supplemental Amendment filed on January 14, 2009.

In rejecting claims 1, 2 and 4-9 for lack of written description, the Examiner acknowledges that the two endpoints of the presently-recited fracture rate range are "adequately disclosed," but asserts that "one cannot use specific and isolated examples to draw support for the much broader limitation for a continuous range."

Applicants assert that the Examiner has misinterpreted and misapplied the governing legal standards regarding the written description requirement in rejecting the present claims. The

Federal Circuit has stated that the question of whether the original description adequately supports later-claimed subject matter "must be determined on a case-by-case basis." Ralston Purina Co. v. Far-Mar-Co, Inc., 772 F.2d 1570, 1575 (Fed. Cir. 1985). Furthermore, when addressing the issue of adequate support for a range limitation, the predecessor court to the Federal Circuit stated that "[b]roadly articulated rules are particularly inappropriate in this area." In re Wertheim, 541 F.2d 257, 263 (CCPA 1976). The Federal Circuit itself has stated that when addressing the question of whether the original disclosure supports a claim to a continuous range, the "issue is whether one skilled in the art could derive the claimed range[] from the [original] disclosure." Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1566 (Fed. Cir. 1991).

The Examiner's broadly articulated rule that specific data points are not adequate to support a claim to all data points that lie between is not sustainable according to governing legal precedent or common sense.

The present Specification as filed discusses the problem of hollow fillers being destroyed during injection molding method, which the Specification states has a negative effect on the relative dielectric constant. (See page 2, lines 26-29). The Specification further describes characteristics of liquid crystal polyester resins, inorganic spherical hollow filler materials and other inorganic fillers that minimize the fracturing of spherical hollow fillers (see, e.g., page 8, lines 1-14; page 10, lines 5-23; page 11, lines 10-12). The specification thus conveys to one skilled in the art that a low

fracture rate of hollow spherical filler material was a contemplated aspect of the present invention.

Moreover, as discussed in the Supplemental Amendment of January 14, 2009, the Specification provides data of six examples of liquid crystal polyester resin products according to the invention (Examples 1-6), from which the fracture rate (X) values are calculated being as equal to 0.048, 0.045, 0.085, 0.094, 0.088 and 0.090, respectively, for each of Examples 1-6. Thus, it is not merely the two endpoints of the range that are disclosed, but six discrete points all falling within the fracture rate limitation as presently recited.

Also, as discussed in the Supplemental Amendment and is seen in Graph 1 attached thereto, the data in the present application illustrates a clear, unidirectional, not erratic relationship between the fracture rate of inorganic spherical filler materials and the dielectric constant of the final molded product, allowing a clear expectation that every point in the range satisfies the same limitation. This is explicitly mentioned in the Specification at, for example, page 2, lines 26-29. It is further noted that all of the Examples described in the specification satisfy both the fracture rate limitation and the limitation that the dielectric constant is less than 3.0, while Comparative Examples 1 and 3, which have fracture rates that are above the presently-claimed range also fail to satisfy the limitation that the dielectric constant is less than 3.0.

In addition, as discussed in the Supplemental Amendment, the fracture rate of hollow sphere filler material, or "X," was a

parameter that was known in the art, and it was further known to express this parameter in terms of a continuous range, as evidenced by the Maeda reference (U.S. 2002/0012862), cited by the Patent Office in the previous Office Action. (See Maeda at, for example, paragraphs [0035], [0036], [0041], [0042] and [0045]-[0047]).

Thus, in view of the above, it is clear that the application conveyed with reasonable clarity to those of ordinary skill that the applicants had invented a molded product comprising a wholly aromatic liquid crystal polymer composition with a low dielectric constant (< 3.0) and a low fracture rate of an inorganic spherical hollow material. Furthermore, based on the Examples, the relevant Comparative Examples, and the prior art (e.g., Maeda), one skilled in the art could easily derive the range of suitable fracture rates as being 0.045 to 0.094, which correspond to the lowest and highest values of the six Examples of the present invention.

As far as the Examiner's argument that discrete data points cannot provide support for a continuous range, "that a claim may be broader than the specific embodiment disclosed in a specification is in itself of no moment." Ralston Purina, 772 F.2d at 1575. In the Vas-Cath case, cited above, the Federal Circuit considered whether figures depicting a single embodiment of a double-lumen catheter adequately supported claims to a catheter having a return lumen with a diameter-ratio in a range between "substantially greater than one-half but substantially less than [one]." The Federal Circuit reversed the district court, which had found a lack of written description for this

limitation, and held that there was a genuine issue of material fact whether the drawings of a single embodiment adequately supported the range limitation. The court stressed that consideration of what the drawings conveyed to persons of ordinary skill was essential, and noted that there was evidence that one of ordinary skill studying the drawings would have understood from them that the return lumen must have a diameter within the range recited in the claims. See Vas-Cath, 935 F.2d at 1565-67.

In the present case, the application as filed describes not just a single embodiment falling within the claimed range, as in Vas-Cath, but six discrete Examples all falling within the range, including both the high and low endpoints of the range.

The fact that the application does not disclose examples of every fracture rate between 0.045 and 0.094 is immaterial to the question of whether this limitation is reasonably conveyed to the person of ordinary skill. Indeed, requiring the inventors to disclose every value within a claimed range would be unduly burdensome and unworkable. The courts have consistently found the recitation of continuous ranges as proper under § 112, particularly where the range limitation describes a well-understood process parameter, like the fracture rate limitation of the present claims. See Wertheim, 541 F.2d at 264 (distinguishing between a claim limitation expressing a process parameter in terms of a continuous range, and broad generic chemical compound inventions, where each compound in the genus is a separate embodiment); see also Union Oil Co. of Calif. v. Atlantic Richfield Co. , 208 F.3d 989, 997 (Fed. Cir. 2000)

("this invention lends itself to description in terms of ranges and variance of those ranges to achieve particular properties of gasoline products").

The fracture rate limitation of the present claims is adequately supported under § 112, and the rejection for lack of written description should be withdrawn.

Anticipation & Obviousness Rejections

The anticipation rejections are traversed on the grounds that the cited Walpita reference fails to disclose each and every limitation of the claimed invention.

As a preliminary matter, the anticipation rejections are traversed on the grounds that the Patent Office has not demonstrated that the contents of the cited Ticona brochure were known in the art prior to the effective filing date of the present application. The Ticona brochure appears to have been printed on January 26, 2009, and bears a copyright date of "1995-2007." The present application has a priority date of June 25, 2002. It is therefore unknown what, if any, of the Ticona brochure was publicly known prior to the priority date of the present invention. Unless the Examiner can show that the relied-upon portions of the Ticona brochure were known in the art prior to the priority date of the present application, the reliance upon this reference is improper, and the rejections based upon it should be withdrawn.

Furthermore, the Ticona reference is not being used to show a "universal fact," as is discussed in MPEP § 2124. The Ticona brochure describes, in very general terms, liquid crystal

polymers sold under the brand name Vectra®. The date of the Ticona reference is unknown, although it may have been published at some point between 1995 and 2007. The Walpita reference, which was filed in 1993, mentions three specific liquid crystal polymers by their trade names: VECTRA® E, VECTRA® A and VECTRA® C. It is unknown whether the specific liquid crystal polymers mentioned in the 1993 Walpita reference are the same as those from the later Ticona brochure, nor can it be determined whether or not the specific polymers mentioned in Walpita possess any of the characteristics described in the later-published Ticona brochure. A trademark, such as Vectra®, merely identifies the source of a product (e.g., Hoerst Celanese Corp.). By itself, a trademark does not describe the physical properties or characteristics of the product(s) sold under the trademark, which of course can change over time. Accordingly, the Ticona brochure fails to provide any appropriate "evidentiary support" to the § 102 rejections based on Walpita, and to the extent the present rejections rely upon Ticona for such support, they should be withdrawn.

With respect to Walpita, the Examiner acknowledges that Walpita fails to disclose a number of limitations of the present claims, but argues that the compositions discussed in Walpita "would have" or "would expect" to meet the limitations of the present claims. Applicant thus understands the Examiner to be asserting a case of inherent anticipation with respect to these features.

"In relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably

support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." Ex parte Levy, 17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990) (emphasis in original).

In the present case, the Examiner has not met his burden of showing inherent anticipation of the present claims. For example, with respect to the limitation of a dielectric dissipation factor of 0.04 or less, as recited in independent claim 1, the Examiner asserts that "given that the dielectric constant [in Walpita] is less than 3...and given the substantially identical LCP composition to that as instantly claimed, the molded product [of Walpita] would have a dielectric dissipation factor within the range as instantly claimed." The Examiner has pointed to no basis in fact or technical reasoning why a material with a dielectric constant of less than 3 would necessarily have a dielectric dissipation factor of 0.04 or less. These are two different parameters, and the Examiner has not demonstrated any relationship between the two that would necessarily result in an inherent anticipation.

Furthermore, the applicant disputes the assertion that the Walpita reference and the present claims relate to "substantially identical" compositions. For example, the compositions of Walpita generally include a lower percentage of liquid crystal polyester than in the present invention (30-60% by weight compared to 45-90% in claim 1) and the compositions of Walpita all require an additional contribution of polytetrafluoroethylene (PTFE) of 10-40% by weight. Moreover, as discussed in greater detail below, Walpita describes extruded

thin films (see, e.g., col. 3, lines 51-54), while the present claims specify a "molded product" obtained by injection molding. The thin films of Walpita are not substantially identical to the molded product of the present claims.

With respect to the limitation that the apparent viscosity of the liquid crystal polyester at a temperature of 20°C above the melting point of the liquid crystal polyester is 5,000 poise or less, as recited in claim 1, the Examiner asserts that Walpita anticipates this limitation because the Ticona brochure mentions Vectra® compositions having "very low melt viscosities." The reliance on Ticona was improper for the reasons discussed above, but even if it was proper to consider the Ticona reference, there is still no teaching of a liquid crystal polyester having the viscosity as presently claimed. A generalized statement of "very low melt viscosities," without any further details or context, is not a disclosure of "an apparent viscosity...at a temperature of 20°C above the melting point of the liquid crystal polyester [that] is 5,000 poise or less." Nor does the Examiner provide any basis or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the Walpita and Ticona references.

Similarly, applicants submit that the Examiner did not make an adequate showing that Walpita anticipates the fracture rate limitation of independent claim 1. The Examiner relies on the examples and the statement that hollow glass spheres having poor crush resistance may be unsuitable, and asserts that one skilled in the art "would expect" Walpita to anticipate the fracture

rate of claim 1. Only one of the examples provided in Walpita has a hollow glass bubble composition of 10-40% by weight, as recited in claim 1. That example includes an estimated solid (broken) glass volume of 2.0%, but as the Examiner acknowledges, Walpita does not disclose a fracture rate of the inorganic spherical hollow material of 0.045 to 0.094, as presently claimed. Again, in order to support a case of inherent anticipation, it is the Examiner's burden to provide some basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art. With respect to the fracture rate limitation, the applicants submit that this burden has not been met.

A more fundamental difference between the present invention and the cited Walpita reference is that the present invention is directed to a "molded product" that is "obtained by injection molding," while Walpita teaches thin films (10-70 mils) formed by extrusion. (See col. 3, lines 51-54). Walpita also specifies that the extruded films include 10-50% by weight of PTFE, (see col. 3, lines 27-29), a material that Walpita acknowledges lacks the physical strength of liquid crystal polymer (see col. 1, lines 38-40). The addition of PTFE as taught by Walpita would be expected to add elasticity and flexibility to the composition, which may be appropriate in the context of extruded thin film layers. It is further noted that PTFE has a lower dielectric constant than liquid crystal polymers (see col. 1, lines 38-40). However, Walpita does not describe or suggest a molded product obtained by injection molding, as is presently recited, and Walpita's teaching to add

a substantial component of PTFE (e.g., a minimum of 10%, suitably 15-35% by weight), which is admittedly lacking in physical strength, would indicate to one skilled in the art that the compositions of Walpita are not appropriate for molded products obtained by injection molding, which require, for example, good dimensional stability. (See Specification at page 1, lines 29-33; page 21, lines 25-26). Unlike the prior art, the present invention alone is able to achieve the balance of high structural strength and rigidity and a low dielectric constant in an injection molded product.

The deficiencies with respect to Walpita are not overcome by the secondary reference, 5,767,223 to Yamada et al. ("Yamada"). The Yamada patent was cited against dependent claims 5-9 for teaching adding fibrous filler material to a liquid crystal polyester resin, but the combination of Walpita and Yamada still fails to teach or suggest the distinguishing characteristics of independent claim 1, described above.

Accordingly, it is believed that all rejections are overcome, and that claims 1, 2 and 4-9 are all allowable.

The Examiner is encouraged to telephone the undersigned attorney to discuss any matter that would expedite allowance of the present application.

Respectfully submitted,

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